WHAT IS CLAIMED IS:

1. A semiconductor optical device, comprising:

a semiconductor substrate;

a stacked body formed at least by a cladding layer having a first conductivity, an active region formed by an active layer or a photoabsorption layer and a cladding layer having a second conductivity, said stacked body being provided on said semiconductor substrate and formed like a mesa stripe;

wherein both sides of said stacked body are buried by a burying layer formed at least by a semi-insulating semiconductor crystal;

said burying layer includes a first layer that is placed adjacent to both sides of said stacked body and a second layer that is placed adjacent to said first layer;

said first layer includes Ru as a dopant;

composition of said second layer is different from composition of said first layer, or, a dopant of said second layer is different from a dopant of said first layer.

2. The semiconductor optical device as claimed in claim 1, wherein said composition of said first layer is Ru-doped InGaAlAs or Ru-doped InAlAs.

3. The semiconductor optical device as claimed in claim 1, wherein said composition of said

first layer is Ru-doped InP.

4. The semiconductor optical device as claimed in claim 2, wherein said composition of said second layer is Ru-doped InP.

5. The semiconductor optical device as claimed in claim 2, wherein said composition of said second layer is Fe-doped InP.

6. The semiconductor optical device as claimed in claim 3, wherein said composition of said second layer is Fe-doped InP.

7. A semiconductor optical device comprising:

a semiconductor substrate;

a stacked body formed at least by a cladding layer having a first conductivity, an active region formed by an active layer or a photoabsorption layer and a cladding layer having a second conductivity, said stacked body being provided on said semiconductor substrate and formed like a mesa stripe;

wherein both sides of said stacked body

are buried by a burying layer formed at least by a semi-insulating semiconductor crystal;

the width of said active region is smaller than the width of said cladding layers of said stacked body; and

a Ru-doped semi-insulating layer is provided in a space between said burying layer and said active region in both sides of said active region.

8. The semiconductor optical device as claimed in claim 7, wherein said Ru-doped semi-insulating layer is Ru-doped InP formed by using mass transport.

9. The semiconductor optical device as claimed in claim 7, wherein a Ru-doped semi-insulating layer is provided as said burying layer by epitaxial growth method such that said Ru-doped semi-insulating layer covers said Ru-doped semi-insulating layer provided in said space.

10. The semiconductor optical device as claimed in claim 9, wherein composition of said Ru-doped semi-insulating layer provided by said epitaxial growth method is Ru-doped InP or Ru-doped InAlAs or Ru-doped InGaAlAs.

11. A method used for fabricating a semiconductor optical device by using mass transport, said method comprising the steps of:

forming a stacked body by successively growing at least a cladding layer having a first conductivity, an active region formed by an photoabsorption layer or an active layer, and a cladding layer having a second conductivity;

forming a mask of a predetermined shape, and etching said stacked body by using said mask, so that a mesa stripe is formed;

etching both sides of said active region by performing selective etching such that the width of said active region becomes smaller than the width of said cladding layers in said stacked body;

burying said both sides of said active region by mass transport while supplying a source material gas including Ru; and

burying both sides of said stacked body with a Ru-doped semi-insulating semiconductor.